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AUTHOR Conklin, George H.
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ABSTRACT

Introductory social science courses could benefit from introducing experiment simulation into the curriculum via the computer. Properly used, the computer should enable the instructor to include the benefits of the laboratory at a reasonable cost into a pre-existing course. The EXPER-SIM (Experiment Simulation) program was combined with PROFIS, a program for introductory sociology, which made possible the inclusion of many techniques of analysis without detracting from a crowded curriculum. Experience has shown, however, that unless the special needs of the beginning student are taken into account, the computer can also introduce confusion into an otherwise well-organized class. An appendix provides an example of simulation program developed for the course. (Author/CHV)

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# EXPERIMENTAL SIMULATION IN INTRODUCTORY SOCIOLOGY: MODIFYING EXPER-SIM TO MEET THE NEEDS OF BEGINNERS

BY

George H. Conklin

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IR 006 425

# Experimental Simulation in Introductory Sociology: Modifying EXPER-SIM to Meet the Needs of Beginners

**George H. Conklin**
*Department of Anthropology and Sociology*
*Sweet Briar College*
*Sweet Briar, Virginia 24595*
*(804) 381-5455 or 847-0442*

## Introduction

The most commonly used method of college-level instruction, especially for introductory courses, is the lecture. The usual lecture is prepared by a professor who has organized ideas, concepts and conclusions in advance and in an hour long period typically makes an opening statement, presents evidence on the subject at hand, and finally makes a conclusion. If the lecture is large, students have little or no opportunity to ask questions and must listen to an uninterrupted presentation. If the class is small, students usually feel free to ask a limited number of narrowly-focused questions designed primarily to clarify issues raised during the lecture by the professor. In either case, the emphasis is on the transmission of facts and conclusions arrived at by others at some time in the past.

Although the physical sciences usually are taught at the introductory level in large lecture courses, as a group the physical sciences have traditionally supplemented lectures with demonstrations designed to show how conclusions can be made by the experimental method. To further reinforce lectures, the natural sciences also require laboratory participation by students where experimental enquiry is taught through replication of common experiments.

Main (1972:245) has argued that the current undergraduate social science curriculum has drifted away from teaching students the fundamentals of the experimental method and has settled instead on instructing students in a set of relatively fixed concepts to be memorized. Students in the social sciences are taught theories advanced by others or perhaps even the results of some research report applying theories. But unlike the laboratory sections in a course such as chemistry, the social-science student is given no direct feeling for what it is like to try to prove or disprove a theory by direct examination of the evidence.

In teaching introductory sociology, the author has noted typical questions by students which show the lack of experience in trying to carefully weigh evidence in making conclusions about human behavior. Students often ask complex questions and then feel cheated if a simple answer is not forthcoming. For example, in discussing the role of nature and nurture in determining human behavior, students would typically ask which was the "real" cause and feel the instructor was avoiding the question if the answer given did not enable them to write one or the other down for their notes. Often a tendency to overestimate the role of the computer would surface when students would ask "in principle" questions such as, "Well, if you had a big enough computer, could not all questions be settled?" Obviously what was needed even at the introductory level was a sociological equivalent of the laboratory experience offered by the physical sciences.

## Experiment Simulation on the Computer

In searching for a way to introduce the social science student to the equivalent of the laboratory situation used in the physical sciences at a reasonable cost, the author

decided to use a set of existing programs developed by Main (1974, 1975; also Thurmond and Cromer 1975) called EXPER-SIM, short for experiment simulation. EXPER-SIM is a group of related programs which simulate an experiment by letting the student develop a hypothesis and then test that hypothesis by exploring the ways in which variables interact. Typically a student selects values for five or six variables and the computer then calculates an outcome and adds error to the calculated answer. Students then must average together several trials to obtain an unbiased answer. Originally conceived as a system of teaching programs for the majors' methods course in psychology at the University of Michigan, EXPER-SIM was evaluated at the University of Michigan by Nussloch (*et al.* 1974) and found to be significantly better in teaching hypothesis testing than conventional lectures and assigned homework. As with the physical sciences, there seems to be a built-in advantage in letting students see for themselves not only general conclusions but also in personally delving into some of the complexities of analysis.

## Problems Faced by Introductory Students With EXPER-SIM

Introducing EXPER-SIM into an introductory sociology course proved far more difficult than at first anticipated. The first effort was made in the fall of 1975 when the SCHIZ model, originally developed by Malin (1974), was made available to introductory students. The SCHIZ model used was a Honeywell FORTRAN translation of the model as it appears on the Louisville Experiment Simulation System (LESS) version of EXPER-SIM. The experiment was discussed in class as a simulation of the different effects of the ways in which individuals are socialized. Students were given a hand-out consisting of the possible causes of schizophrenia (Malin 1974:57-60) and a decision sheet explaining the variables and the values each variable could take. Since the model used was identical to the LESS version of SCHIZ, at that time SCHIZ merely asked the student if she wanted to be prompted (y or n) and if so, typed out the names of each variable (as in the Appendix). If not, the program asked for seven parameters followed by commas. No other instructions were offered or available to the student.

In theory using SCHIZ seemed simple enough. But in fact, introductory students found the unmodified EXPER-SIM program more confusing than expected. It became another burden to be finished and thus only poorly taught the principles of the experimental method. Even though the students had been instructed otherwise, they would continually: (1) change two variables at a time making it impossible to tell which change had produced a certain effect, (2) spend hours trying to work all combinations, only to give up in frustration, or, (3) try to save time by doing only one replication, thus failing to average out the simulated measurement error.

In writing up the reports, the freshmen faced a problem common to graduate students: how to structure an answer. An even larger problem was the sense of panic developed by about a quarter of the class which felt that the machine was pushing them and not giving them sufficient chance to think. While the very purpose of the experiment simulation was to show that every possibility could not be tried, some who had not actually tried out all combinations wrote in their reports that they felt fewer trials should be made so more and different combinations could be tried out. Lastly, report writing reflected the fact that the students, at least at Sweet Briar College, tended to forget to take the decision sheet with them to the terminal room and thus were confused when the program itself did not contain a full set of instructions. Rather than help the course, the unmodified SCHIZ model became a detriment.

## Modifying EXPER-SIM for Freshmen

My initial feeling that to use EXPER-SIM at the introductory level it would be necessary to modify the printed instructions and the handouts proved to be false. What was

necessary was to modify the program itself. More specifically, it turned out that to make SCHIZ and experiment simulation meaningful for a general survey introductory sociology course, the computer program itself would have to be self-contained. Students expected to use the computer much as they would the textbook—to explain something that they did not understand. The command "Enter 7 parameters followed by commas" merely confused rather than instructed the beginner.

The modifications which made EXPER-SIM successful for the freshman can best be illustrated by examining the output in the Appendix. For sake of brevity, the modifications and what was accomplished by each are listed below:

1. The title and text: To tie the program to the substantive issues raised in the course, several basic highlights on the debate over the relative strengths of nature and nurture on the individual are mentioned. This places the experiment in perspective before facing the student with any decisions. It helps make the student feel at home before requiring any active intervention.

2. The experiment: This paragraph introduces the problem of measurement and measurement error. It also reminds the student of the importance of changing only one variable at a time in order to compare two groups of people. Since the purpose of the entire exercise is to teach the experimental method, this reminder is very important for students to keep in mind.

3. The choices to be made: To overcome the problem of the student who forgets the decision sheet, and especially to encourage a careful reading of the options, the decision sheet is included in the text, not as a handout in class.

4. The record of decisions and trials: The record of decisions and a place to write down the trial scores solved the problem of the student who literally lost her findings on a twenty-foot roll of output. By forcing the student to copy each answer into the correct column as it is computed, attention is drawn to the actual values which previously were often ignored until sometime later. After typing out the blank tables the computer pauses for twenty seconds to enable students to tear off the output and get ready to proceed.

5. Instructions: The instructions remind each student of what she needs to know in order to complete the experiment. At the end of the instructions, the machine pauses until instructed to proceed. This pause is extremely important for those who have little confidence in their abilities on the computer. It gives beginners the time to study the instructions and to make some decisions on what to do next. While the student who is confident simply proceeds without delay, poor students gain confidence by being told "you are in control."

6. The Louisville Simulator: The Louisville Experiment Simulator was modified in four ways. First, the student is always asked for each variable by name. Secondly, whatever decisions are chosen are retained for ten trials. This modification cut down dramatically on errors while forcing each student to conduct ten trials. Thirdly, to allow time to write down each test score, the return button must be pushed for the program to continue. Lastly, the random number generator was slightly modified to permit a truly random seeding value for each experiment.

7. Calculations of means and medians: As an aid to teaching the meaning of several measures of central tendency, students are permitted to call in a specially modified library routine to compute the means and medians of their test values and, by placing the scores in rank order, the program also lets the student see if a mode is present. Because of the modifications to the program, students need not be careful not to put a comma at the end of each data line, another common error. If a value is left out, the machine checks to see if all 10 values have been entered; if not, it asks for more data.

8. Error corrections: If an error has been made in entering data, a student is permitted to return to the start of the program which calculates the measures of central tendency.

9. Instructions for the homework: Lastly, students are given brief instructions on hand-

ing in the homework. Since the tables upon which the students enter their findings are exactly eleven inches long, the results fit neatly in a folder. Because many students had seen "Sybil" on television or had read the book (which was on the best seller list during the fall of 1976), it was suggested that their "scientific" findings might be compared with a literary interpretation by a popular author.

### The Results

The above modifications turned EXPER-SIM into a highly useful teaching tool for a general survey course dealing with students who had had little experience on the computer. Although time consuming to enter all the modifications, the most common problems faced by the introductory student seem to have been met. The proportion of papers turned in where the student had been able to make useful conclusions rose from 62 percent without the modifications to nearly 95 percent with the more complete instructions.

More importantly, the two students who run the aid desk and who were assigned to the introductory sociology sections reported that while in the fall of 1975 "many" students had asked for help with the unmodified program, in the fall of 1976 with the modified SCHIZ model only a small fraction of those doing the assignment needed aid. The most common problem remains careless reading of instructions. One student, however, read the number "100" as "1" because she felt the "00" were zeroes that the teletype had "crossed out" as errors. There seems to be no way to accurately predict this type of problem.

### Conclusions

Introductory courses in the physical sciences use experiments in the laboratory as an aid in instruction. Introductory social science courses could also benefit from introducing experiment simulation into the curriculum. Properly used the computer should enable the instructor to include the benefits of the laboratory at a reasonable cost into a pre-existing course. At present, the author combines EXPER-SIM with a program for introductory sociology (PROFIS) developed earlier (Conklin 1976). Together, both programs enable inclusion of many techniques of analysis without otherwise detracting from a crowded curriculum. Experience has shown, however, that unless the special needs of the beginning student are taken into account, the computer can also introduce confusion into an otherwise well-organized class.

### A Technical Note

The modifications of EXPER-SIM described here were carried out in BASIC on a Honeywell 1640 which allows no string variables or programs of over 150 lines in BASIC. The decision to keep the text in BASIC and the simulator in FORTRAN was made because disk space is at a premium while compute time is freely available. While most small colleges like Sweet Briar College probably have small computers, sometimes small computers also lack a billing system which enables their use at will by instructors. Such is the case at Sweet Briar.

The SCHIZ model is one of the models in common with both the Michigan version of EXPER-SIM (MESS) and the Louisville version (LESS). While frequent chaining and the piecework nature of the modifications may sound crude to those familiar with larger computer systems, small college computers often lack disk space, forcing storage of longer programs in various accounts. Further, since students do not see these problems in their printouts, they do not affect the outcome in terms of learning efficiency. At regular ASR 33 teletype speed of ten characters per second, the average student spends fifty-five minutes on the homework assignment described here.

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## APPENDIX (Conklin)

### THE FAMILY AND SOCIAL BEHAVIOR

IN MOST IF NOT ALL SOCIETIES OF THE WORLD, CHILDREN ARE BORN INTO A FAMILY AND IT IS THE FAMILY WHICH HAS THE FIRST CHANCE TO SOCIALIZE AND INFLUENCE THE CHILD. EFFORTS TO SOCIALIZE CHILDREN BEGIN IMMEDIATELY AFTER BIRTH. THE BABY WHICH SLEEPS ALL DAY AND CRIES ALL NIGHT IS STRAIGHTENED OUT QUICKLY BY SLEEPY PARENTS. OUR CULTURE EVENTUALLY SOCIALIZES THE CHILD TO GET HUNGRY THREE TIMES A DAY AT BREAKFAST, LUNCH AND SUPPER, WHILE OTHER CULTURES BELIEVE THAT THE HUMAN ANIMAL NATURALLY GETS HUNGRY JUST TWICE A DAY.

ON A MORE COMPLEX LEVEL, CHILDREN ARE SOCIALIZED INTO ADULT ROLES AS THEY GROW. SOME SOCIOLOGISTS SUCH AS WESTON LA BARRE HAVE ARGUED THAT BOTH NATURE AND NURTURE HAVE PLAYED A PART IN THE FORMATION OF HUMAN SOCIETY TAKEN AS A WHOLE. LA BARRE THINKS THAT THE EVOLUTION OF THE HUMAN FAMILY DEPENDED ON WHAT HE CALLS THE YEAR ROUND SEXUALITY OF WOMAN. IN EARLIER TIMES IT WAS NECESSARY FOR MEN TO HELP RAISE THE CHILDREN BECAUSE HUMAN INFANTS ARE BORN SO COMPLETELY HELPLESS THAT THEY REQUIRE INTENSE CARE IN ORDER TO SURVIVE. FOR LA BARRE, BOTH NATURE AND NURTURE ARE IMPORTANT IN INFLUENCING THE HUMAN FAMILY AND IN, IN HIS WORDS, GETTING THE FATHER TO STAY HOME.

WHEN SOCIALIZATION IS SUCCESSFUL AND A CHILD GROWS UP TO BE A REASONABLY SUCCESSFUL ADULT, FEW PEOPLE TAKE MUCH INTEREST IN THE DETAILS OF THE SOCIALIZATION PROCESS. BUT WHEN SOMETHING GOES WRONG AND A CHILD BECOMES DEVIANT OR MENTALLY ILL, THE QUESTION IS OFTEN RAISED, WHAT WENT WRONG? IS A PERSONS INABILITY TO MAKE DECISONS OR FUNCTION AS AN ADULT PART OF HIS OR HER EARLIER TRAINING? WOULD THE INDIVIDUAL HAVE TURNED OUT BETTER IF SOCIALIZED BY A BETTER OR MORE COMPETENT SET OF PARENTS? THESE AND MANY OTHER QUESTIONS CAN BE RAISED UNDER SUCH CIRCUMSTANCES.

SCHIZOPHRENIA IS AN EXAMPLE OF DEVIANT BEHAVIOR WHERE THE ETIOLOGY (ORIGIN) OF THE DISEASE IS NOT AGREED UPON. SOME AUTHORS TRACE ITS ORIGIN TO THE DOUBLE BIND WHERE A PERSONS PARENTS WOULD ASK A CHILD NOT TO DO SOMETHING AND THEN WOULD PUT THE CHILD DOWN FOR DOING THE OPPOSITE...A SORT OF HEADS I WIN TAILS YOU LOSE SITUATION. THE RESULT IS THAT A CHILD GROWS UP UNABLE TO FUNCTION AS AN ADULT.

RATHER THAN SOCIALIZATION OR NURTURE AS A SOURCE OF SCHIZOPHRENIA, SOME AUTHORS SAY THAT NATURE PLAYS A CRUEL TRICK ON SOME UNFORTUNATE PERSONS. THERE IS SOME EVIDENCE TO SUGGEST THAT SCHIZOPHRENIA IS CAUSED BY A PERSON BEING UNABLE TO PROCESS CERTAIN CHEMICALS PROPERLY AND THUS A SCHIZOPHRENIC IS ACTUALLY INTOXICATED BY CHEMICALS SIMILAR TO LSD. A GENETIC MISTAKE CAUSED BY NATURE IS THUS SEEN AS A CAUSE OF DEVIANT BEHAVIOR, NOT IMPERFECT SOCIALIZATION BY MISGUIDED PARENTS IN THE FAMILY.

## THE EXPERIMENT

HOW WOULD A REASONABLE PERSON GO ABOUT DETERMINING THE RELATIVE IMPORTANCE OF SOCIALIZATION (NURTURE) AND NATURE IN DETERMINING DEVIANT BEHAVIOR?
ONE WAY IS TO CONDUCT AN EXPERIMENT TO EXAMINE THE FAMILIES OF THOSE WHO LATER BECAME MENTALLY ILL. YOU MIGHT ASK YOURSELF WHAT WAS DIFFERENT IN THE FAMILIES OF THOSE WHO PRODUCE MENTALLY ILL CHILDREN AS COMPARED TO THOSE FAMILIES WHERE THE CHILDREN ARE NORMAL. TAKE THE CASE OF IDENTICAL TWINS. THERE ARE CASES ON RECORD WHERE IDENTICAL TWINS HAVE BEEN SEPARATED AT BIRTH AND RAISED BY DIFFERENT FAMILIES. IF BIOLOGY WERE THE CAUSE, THEN YOU COULD LOOK AT THE RATES OF MENTAL ILLNESS AMONG IDENTICAL TWINS RAISED BY DIFFERENT FAMILIES TO SEE HOW SIMILAR (OR DIFFERENTLY) THE TWO GROUPS TURNED OUT.

OTHERS BEFORE YOU HAVE EXAMINED THE EFFECTS OF NATURE AND NURTURE ON CHILDREN SOCIALIZED IN DIFFERENT TYPES OF FAMILIES. THIS TEACHING PROGRAM ENABLES YOU TO EXAMINE SOME OF THE RESULTS OF EXISTING RESEARCH.

IN THE REAL WORLD, MEASURING THE RATE OF MENTAL ILLNESS AMONG VARIOUS GROUPS IS EASIER SAID THAN DONE. SOMETIMES THE EXPERTS DISAGREE ON THE DIAGNOSIS, OR THEY MAY DISAGREE HOW SEVERE THE ILLNESS IS. ALSO, THERE IS RANDOM ERROR INVOLVED IN MEASUREMENT, SO TRUSTING ONE STUDY IS NOT GOOD ENOUGH. TO OVERCOME ERROR, MOST STUDENTS OF SOCIETY ASSUME IT IS BEST TO TAKE THE AVERAGE OF SEVERAL DIFFERENT TRIALS OR MEASUREMENT EFFORTS AND AVERAGE THE RESULTS.

RUN

THE CHOICES YOU CAN MAKE IN YOUR MEASUREMENT EFFORTS ARE AS FOLLOWS:

1. NUMBER. HOW MANY PEOPLE DO YOU WISH TO MEASURE? USE 100. THE MAXIMUM PERMITTED RANGE IS 20 TO 225.
2. INDEX. DIAGNOSIS OF INDEX SUBJECT. 1 = SCHIZOPHRENIC 2 = NONSCHIZOPHRENIC.
3. RELATION. WHAT IS THE RELATIONSHIP OF YOUR GROUP TO THE INDEX SUBJECT. FOR EXAMPLE, IF YOU CHOOSE 8, AND NUMBER = 100 AND INDEX = 2, YOU WILL BE EXAMINING THE PROPORTION OF THAT GROUP OF 100 OFFSPRING TO BECOME MENTALLY ILL LATER.
   1=UNRELATED 2=AUNT/UNCLE 3=COUSIN
   4=SIBLING 5=IDENT. TWIN 6=NON-IDENT. TWIN
   7=PARENT 8=OFFSPRING
4. ADOPT. NATURE OF RELATIONSHIP OF YOUR GROUP TO ACTUAL INDEX SUBJECT...IF APPLICABLE. 1=BIOLOGICALLY RELATED AND NEVER SEPARATED. 2=BIOLOGICALLY RELATED BUT SEPARATED IN INFANCY. 3=RELATED BY ADOPTION IN EARLY INFANCY.

5. DIAGNOSIS. STRICTNESS OF DIAGNOSIS. 1=SCHIZOPHRENIC PSYCHOSIS ONLY--A STRICT DIAGNOSIS. 2=SCHIZOID PERSONALITY ALSO.
6. SEX. 1=SAME AS INDEX SUBJECT, 2=OPPOSITE.
7. METHOD. METHOD OF DIAGNOSIS. 1=SAME PERSON LOOKS UP INDEX SUBJECTS, ACTUAL SUBJECTS AND DIAGNOSES THE LATTER. 2=DIAGNOSIS PERFORMED BY SOMEONE WHO DOES NOT KNOW IF INDEX SUBJECT IS SCHIZOPHRENIC OR NOT.

HOW TO CONDUCT YOUR EXPERIMENT

BELOW WILL BE PRINTED OUT A DECISION SHEET. WHEN THE DECISION SHEETS ARE PRINTED OUT, THE COMPUTER WILL PAUSE FOR 15 SECONDS. PLEASE TEAR THE SHEET OFF THE TELETYPE SO YOU CAN WRITE ON IT. THEN AWAIT INSTRUCTIONS.
RUN

RECORD OF DECISIONS: WHAT I MEASURED

MY CHOICES FOR EXPERIMENT NUMBER: (FILL IN)

| VARIABLE CHOICE | EXPERIMENT # 1 | EXPERIMENT # 2 | EXPERIMENT # 3 | EXPERIMENT # 4 |
|---|---|---|---|---|
| NUMBER: | | | | |
| INDEX: | | | | |
| RELATION: | | | | |
| ADOPT: | | | | |
| DIAGNOSIS: | | | | |
| SEX: | | | | |
| METHOD: | | | | |

RECORD BELOW THE INDIVIDUAL TRIAL SCORES FOR EACH EXPERIMENT:

NUMBER OF PERSONS FOUND TO BE SCHIZOPHRENIC PER TRAIL: (FILL IN)

| | EXPERIMENT # 1 | EXPERIMENT # 2 | EXPERIMENT # 3 | EXPERIMENT # 4 |
|---|---|---|---|---|
| TRIAL #1: | | | | |
| TRIAL #2: | | | | |
| TRIAL #3: | | | | |
| TRIAL #4: | | | | |
| TRIAL #5: | | | | |

| | | | | |
|---|---|---|---|---|
| TRIAL #6: | | | | |
| TRIAL #7: | | | | |
| TRIAL #8: | | | | |
| TRIAL #9: | | | | |
| TRIAL #10: | | | | |
| AVERAGE OF TEN VALUES: | | | | |
| MEDIAN OF TEN VALUES: | | | | |
| MODE OF TEN VALUES: | | | | |

----------(TEAR OFF HERE)----------

RUN

INSTRUCTIONS

1. LOOK AT THE POSSIBLE VALUES LISTED ABOVE FOR EACH DECISION.

2. MAKE A DECISION ON WHICH VALUES YOU WISH TO TEST.

3. USING A PENCIL, WRITE THOSE VALUES DOWN IN THE COLUMN LABELED EXPERIMENT # 1.

4. AFTER YOU HAVE LISTED THE NUMBERS YOU WISH TO USE, PLEASE ENTER THE VALUE 1 INTO THE TELETYPE, WHICH WILL NOW STOP AND WAIT FOR YOU TO FINISH.

5. THE EXPERIMENT SIMULATOR WILL ASK YOU FOR YOUR VALUES, WHICH YOU SHOULD THEN ENTER. TRIAL # 1 WILL THEN BE DONE AND THE ANSWER PRINTED. WRITE DOWN THE FIRST ANSWER IN THE SPACE PROVIDED ABOVE UNDER EXPERIMENT # 1

6. WHEN YOU ARE READY FOR THE SECOND TRIAL, PUSH RETURN AND THE SECOND TRIAL WILL BEGIN. AFTER TEN TRIALS, YOU WILL BE ASKED TO CHANGE YOUR CRITERIA.

```
 WHEN READY TO RESUME, TYPE 1 AND PUSH RETURN
!!

 LOUISVILLE EXPERIMENT SIMULATION SYSTEM
 NATURE OR NURTURE SIMULATION
 IN REFERENCE TO THE DECISION SHEET ABOVE, PLEASE
  ENTER THE CODE NUMBERS FOR WHAT YOU WANT TO STUDY.
NUMBER  =?! 100

INDEX   =?! 1

RELATION=?! 5

ADOPTION=?! 1

DIAGNOS =?! 2

SEX     =?! 1

METHOD  =?! 2

  24 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  32 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  28 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  30 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  29 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  30 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  30 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  24 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  30 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.
 PRESS RETURN WHEN YOU ARE READY FOR THE NEXT TRIAL!

  31 PERSONS IN THIS GROUP OF 100 WERE DIAGNOSED AS SCHIZOPHRENIC.RUN


    YOU HAVE NOW SUCCESSFULLY COMPLETED TEN TRIALS WITH ONE
 SET OF VALUES.  NOW, BEFORE PROCEEDING, BE CERTAIN TO HAVE
 ALL YOUR VALUES CORRECTLY LISTED IN YOUR TABLE.

    NEXT, AVERAGE THE TEN VALUES (ADD THEM AND DIVIDE BY TEN)
 TO GET THE BEST SINGLE MEASURE OF THE INCIDENCE OF SCHIZOPHRENIA
  IN YOUR TRIAL GROUPS.

    ALSO, FILL IN THE MEDIAN OR MIDDLE-VALUE AND THE MODE
  OR SINGLE MOST COMMON VALUE IN THE PLACES PROVIDED.
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```
    WOULD YOU LIKE SOME HELP IN DOING THE AVERAGE?  IF.SO,
 TYPE 1.  IF NOT TYPE 2 AND DO THE AVERAGES BY HAND.

!1
RUN


    THIS PROGRAM FINDS THE MEAN AND MEDIAN OF YOUR 10 TRIAL
  SCORES FOR YOUR EXPERIMENTS.  WHEN THE ! APPEARS, ENTER
  5 OF YOUR VALUES ON ONE LINE SEPARATED BY COMMAS.  PUSH RETURN
    THEN ENTER THE SECOND SET OF 5 VALUES SEPARATED BY COMMAS
  AND PUSH RETURN.


  TYPE IN 5 TRIAL SCORES PER LINE SEPARATED BY COMMAS:
!24,32,28,30,29
O.K. PUT IN 5 MORE
!30,30,24,30,31


 THE SCORES FROM YOUR EXPERIMENT IN RANK ORDER ARE AS FOLLOWS:

    32          31          30          30          30

    30          29          28          24          24


NO. OF SCORES  THE MEAN IS  THE MEDIAN IS

    10          28.8        30



    PLEASE CHECK TO MAKE CERTAIN YOU HAVE CORRECTLY ENTERED THE
 CORRECT VALUES FROM YOUR DECISION SHEET.  IF BY CHANCE YOU HAVE
 A MISTAKE, THEN TYPE 1 AND YOU WILL AGAIN BE ABLE TO ENTER YOUR
 VALUES.  IF YOU ARE READY TO PROCEED, TYPE 2.
    IF YOU ARE DONE WITH ALL FOUR EXPERIMENTS AND WISH TO STOP,
 THEN TYPE 3 AND THE PROGRAM WILL SIGN OFF.
!3
RUN

    IF YOU HAVE NOW COMPLETED YOUR FOUR EXPERI-
 MENTS, PLEASE WRITE UP YOUR THOUGHTS ABOUT THE
 CORRELATES OF SCHIZOPHREINIA IN ONE OR TWO TYPED PAGES.
 CONSIDER THE RELATIVE FORCE OF NATURE AND THE RELATIVE FORCE OF
 NURTURE.  WHICH DO YOU FEEL INFLUENCES BEHAVIOR?  EXPLAIN WHY.
 BE CERTAIN TO ATTATCH TO YOUR DISCUSSION THE DECISION
 SHEET WHICH YOU HAVE FILLED OUT.  IT IS NOT NECESSARY
 TO TURN IN THE REST OF THE OUTPUT.

    DID YOU SEE SYBIL ON T.V. THIS FALL?  YOU MAY MAKE REFERENCE
 TO THAT FILM IF YOU WISH.



  170 EXIT

?
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